

REMARKS

Claims 1-17, 19-21, 23 and 25-35 stand rejected in the Office Action mailed July 16, 2002. Claims 18, 22, 24 and 36 have been cancelled and new claims 37-39 have been added. No new matter has been entered. By this amendment, claims 1-17, 19-21, 23, 25-35 and 37-39 are now pending. Applicants respectfully request that the above-identified application be reconsidered in view of the amendments and remarks which follow, entry of the amendments and that each of the presently pending claims be allowed and the application be passed to issue.

Claim Objections

The applicants have considered the examiner's objection and, in response, have amended the claims. The applicants believe that the amendments enclosed herein should satisfy the Examiner's formal objections to the claims.

35 USC 102

Claims 1-3, 6-8, 14, 15, 19-28 and 30-36 stand rejected under 35 U.S.C. 102(b) as being anticipated by Weaver et al. (US 2,894,726).

It is respectfully submitted that the rejection of claim 1 under 35 USC 102 is improper and should be withdrawn as Weaver '726 does not disclose each and every limitation set forth in claim 1 as required under 35 USC 102. Claim 1 recites

"... a monolithic hard insert being affixed to the bit body at the axial forward end thereof, and the hard insert presenting at least three discrete leading cutting edges for cutting the earth strata wherein each said at least three cutting edges is stepped."

In paragraph 3 of the Office Action, the examiner refers to 14 in figure 1 of Weaver et al. as the leading cutting edge. The examiner is requested to clarify her

position along these lines. The applicants do not agree that the element identified as number 14 in Weaver et al. would be considered by an ordinary artisan to be a cutting edge. Number 14 identifies a surface. An edge, in *The Random House Dictionary*, is defined as a line where a surface end and/or a line where two surfaces of a solid meet. Consistent with this definition, the specification in Weaver et al. identifies the line 26, where two surfaces meet as a cutting edge (see column 3, lines 10-20, not feature 14 as identified by the Examiner as a cutting edge). The cutting edge is known in the industry as the line of contact between the bit and substrate that penetrates and separates material from the substrate. The applicants apply this terminology along these same lines, as can be seen in the drawings at identification number 76, number 76 is identified in the applicant's specification as the cutting edge.

The cutting edges in Weaver et al. are formed by a plurality of separate inserts 24 made from tungsten carbide as described in column 3, lines 3-15. The inserts 24 are received in recesses forged in the blade 14. The inserts 24 are secured to the blade 14 either by a shim or soldering material, column 7, lines 25-47. The monolithic blade 14 in Weaver et al., forged as one piece, does not form the cutting edges of the bit. The cutting edges are formed by a plurality of inserts 24.

The plurality of inserts in Weaver et al. are disclosed in Weaver et al. as, preferably, being nonuniform in composition. The outer corners of the inserts contain harder particles than the remaining portion of the inserts. The harder particles reduce the otherwise greater wear that would occur at the outer corner of the insert during operation. Weaver et al. discloses impregnating the corners of the inserts with diamond-like particles, see column 7, lines 5-25.

Under 35 USC 102, each and every element and each and every structural feature recited in the claims must be explicitly disclosed in the reference. The Weaver et al. patent does not disclose a monolithic hard insert member having at least three cutting edges.

Original claims 22, 24 and 36, which recited the hard insert as being monolithic, have been cancelled by this amendment, and their limitations incorporated into independent claims 19, 23 and 32. Similarly, amended claims 19, 23, 32 and new claim 37, it is averred by applicants, that for the reasons set forth immediately above, the rejection of claims 19, 23 and 32 under 35 USC 102 as anticipated by Weaver et al. be withdrawn, and that new claim 37 likewise is patentable over Weaver et al. Further, all the claims that depend from claims 1, 19, 23, 32 and 37 are patentable over Weaver et al. under 35 USC 102 for the reasons above.

35 USC 103

Claims 4, 5 and 9 stand rejected under 35 U S.C. 103(a) as being unpatentable over Weaver et al.

In claim 4, lower step and upper step cutting edges are recited as being a negative 20 degrees below the horizontal. The Examiner submits that Weaver et al. discloses the upper step cutting edge as being at an angle of 20 degrees and admits that the lower step is horizontal. The Examiner declares that, in view of the negative 20 degree angle of the upper edge, it would have been obvious to construct the lower step cutting edge to be at an angle of 20 degrees below the horizontal. The purpose of the upper step cutting edge at 42 in Weaver et al. being oriented at negative 20 degrees, as described in column 8, is for the purpose of preventing walking of the bit as the pilot hole is initially being drilled. Along these lines, there would be no motivation for an artisan to modify the lower cutting edge in Weaver et al.

to have a negative 20 degree slope, since the lower step cutting edge does not assist in forming the pilot hole. Note, as described in Weaver et al., all other steps (lower) have a horizontal cutting edge, not a sloped edge, see column 8, lines 39-44.

With respect to the Examiner's position that it would be within the realm of routine engineering skill to find an optimum step height of between 1/16-1/8 inches for the bit of Weaver et al., the applicants disagree. The Examiner is employing impermissible hindsight. The Examiner is using the present application as a guideline in constructing the claimed invention. The Examiner is requested to appropriately show with a reference that it is well known in the mechanical arts to have a step height of between 1/16-1/8 inches.

Claims 10-12, 16, 17 and 29 stand rejected under 25 U.S.C. 103(a) as being unpatentable over Weaver et al. in view of Brady. The Examiner has not established a proper *prime facie* case of obviousness under 35 USC 103. There is no motivation to combine the references as averred by the Examiner. It is believed that such tensile fracture problems would be more problematic with larger cemented tungsten carbide inserts than a drill with a plurality of smaller inserts as in Weaver et al. The Brady patent discloses a roof bit not with three stepped cutting edges, but a bit with two curved cutting edges.

Claim 13 stands rejected under 25 U.S.C. 103(a) as being unpatentable over Weaver et al. in view of Nance. It is respectfully submitted that the Examiner has not established a proper *prime facie* case of obviousness under 35 USC 103. In Nance, the roof bit cutting edge includes a cutting edge having an upper portion 30 and an outer portion 34. The upper portion and outer portion, as shown in figures 5 and 6 respectively, have relief angles "A" and "B" that are

described in column, 3 lines 59-62, as both being twenty-five (25) degrees. Also, in column 2, lines 20-25, the relief angles of the upper portion and end portion of the cutting edge are disclosed as being equal.

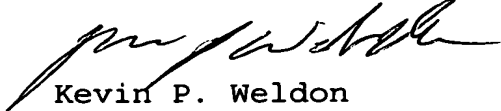
Claim 13 recites that the upper cutting edge has a relief angle of 30 degrees and the lower cutting edge step has a relief angle of 21 degrees. This recitation is in direct contrast to the description in Nance that the relief angle of the cutting edge remain constant along the length of the cutting edge. Nance teaches away from the limitations recited in claim 13. There is no teaching in Nance or in Weaver et al. to construct a stepped bit wherein the relief angle of an upper step differs from the relief angle of the lower step. The Examiner has failed to establish a proper *prime facie* case of obviousness.

In view of the above amendments and comments, it is believed that claims 1-17, 19-21, 23, 25-35 and 37-39 are patentable over the art of record. Thus, applicants respectfully request a Notice of Allowance indicating claims 1-17, 19-21, 23, 25-35 and 37-39 as being allowable. If for any reason the Examiner does not believe that the application is in condition for allowance, the Examiner is requested to telephone applicants with any comments or questions (724-539-3848) in order to expedite prosecution of the application.

Applicants petition for an Extension of Time of three months, from July 16, 2002. Please charge fees to Deposit Account 11-0508.

The Commissioner is hereby authorized to charge any fees, including additional filing fees required under 37 CFR 1.16 and 1.17, in connection with this submission to Kennametal Inc. corporate Deposit Account 11-0508.

Respectfully submitted,



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AMENDMENT

(Version with markings to show changes made)

5. (Amended) The rotary drill bit of claim 2 wherein a cutting edge transition portion is positioned between the lower step cutting edge and the upper step cutting edge the transition portion rises a vertical height of generally between $1/16$ - $1/8$ inches.

8. (Amended) The rotary drill bit of claim 6 wherein each of the stepped cutting edges has a[n] radially inward upper step and a radially outward lower step.

19. (Amended) A rotary drill bit for penetrating earth strata, the drill bit comprising: an elongate bit body having an axial forward end; and a monolithic hard insert being affixed to the bit body at the axial forward end thereof, and the hard insert having at least three discrete leading cutting edges for cutting the earth strata wherein each said at least three leading cutting edges are nonlinear.

23. (Amended) A monolithic hard member for attachment to a drill bit body so as to form a rotary drill bit for penetrating the earth strata and the rotary drill bit having a central longitudinal axis, the monolithic hard member comprising: at least three discrete leading cutting edges for cutting the earth strata, projecting from the forward surface of the hard member wherein each said at least three cutting edges, is stepped whereby the step improves the disintegration of the earth strata.

25. (Amended) The hard member of claim 2[4]3 wherein the hard insert further including a side clearance cutting edge for cutting the earth strata corresponding to each one of the leading cutting edges for cutting the earth strata.

26. (Amended) The rotary drill bit of claim 2[4]3 wherein said at least three stepped cutting edges has an upper step and a lower step.

32. (Amended) A monolithic hard member for attachment to a drill bit body so as to form a rotary drill bit for penetrating the earth strata said hard member comprising: at least three discrete leading cutting edges for cutting the earth strata wherein each said at least three leading cutting edges are nonlinear.